Wyoming Oil and Gas Conservation Commission

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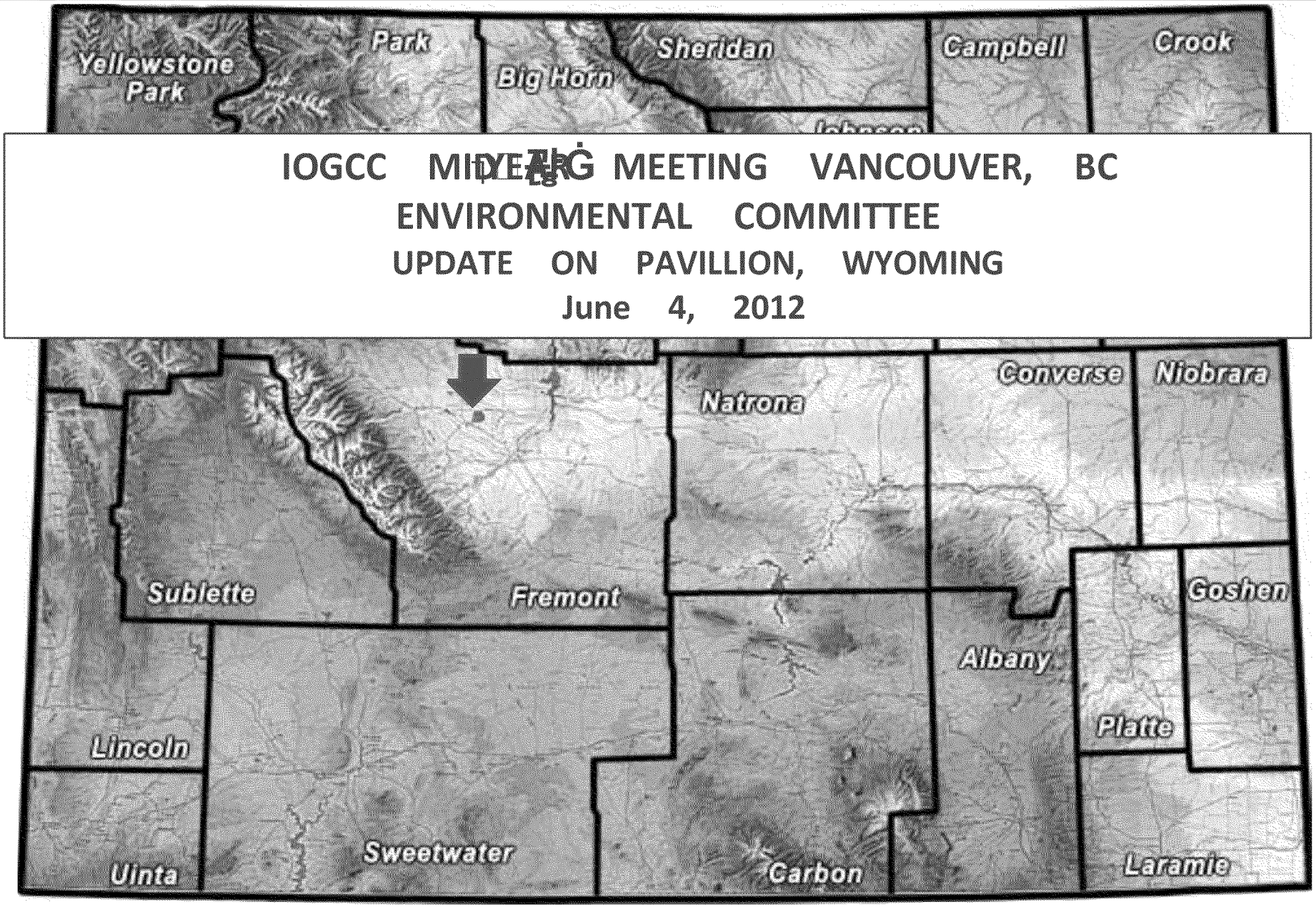

IOGCC MIDYEAR MEETING VANCOUVER, BC
ENVIRONMENTAL COMMITTEE
UPDATE ON PAVILLION, WYOMING
June 4, 2012

WHAT IS ALL THE CONTROVERSY REGARDING THE EPA DRAFT PAVILLION FIELD INVESTIGATION REPORT?

Executive Summary

Landowner complaints of bad drinking water taste and odor was investigated by State Agencies. Not getting the response desired, in 2008 the EPA was asked by certain individuals living within the Pavillion gas field to determine the cause of bad taste and odor in water supply wells. The draft report, found at http://www.epa.gov/region8/superfund/wy/pavillion/ addresses water sampling at two monitoring wells drilled and shallow domestic and stock water supply well testing in 2009 and 2010 by EPA. The results are inconclusive as to the cause of or even if gas field contamination exists. Naturally occurring biogenic methane, not related to gas field activities, was found in a few water supply wells.

The report was issued by EPA with incomplete, inadequate, and minimal science; before the data was reviewed by Wyoming agencies as before verified by further testing; before the data was peer reviewed through process; and before all data was provided.

The report does not address the original complaint of wells with bad taste and odor but erroneously concludes that a chemical used in fracturing caused groundwater contamination and ignores potential other sources of contamination including those introduced by EPA itself.

Pavillion Natural Gas Field
Wind River Basin
Fremont County Wyoming

- Approximately 5 miles northeast of the Tow of Pavillion in the center of the Wind Rive Reservation
- Area of Concern approximately 5 miles W by 4 miles N
  - 168 natural gas wellbores, 100 producer
  - 5 public, 37 domestic and 4 stock wa pit monitoring wells and 2 EPA monitori

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The Town of Pavillion water supply wells are completed in the Wind River Formation, the same formation that is the aquifer and the natural gas reservoir

Town of Pavillion

Site Area

From EPA Draft Investigation of Ground Water Contamination near Pavillion, Wyoming Dec 2011

- The EPA made public the Pavillion Draft Report on Ground Water December 2011
  Last data provided was on January 31, 2012 timony at the House of EPA Subcommittee on Energy and the Environment.

- EPA concluded that contamination of groundwater was caused by a chemical used in hydraulic fracturing based solely on a single detect in a single mon

- ***Due to unanswered questions by EPA on the data and wells, the State agency and industry experts cannot make any conclusions regarding groundwater contamination based on the monitoring well data provided by EPA.***

State agency scientists contend that the organic chemical compounds detected were introduced by EPA into the monitoring wells during completion, drilling, testing, sampling and laboratory analyses.

- EPA's conclusion erroneously escalates the local Pavillion ground water data to the national and international level which further obscures the possibilities for public understanding. The quality of the debate continues to suffer as the EPA science itself is questioned.

- The EPA conceptual scientific model, lines of reasoning, found on the report and released to the public two monitoring wells and two sampling events.

- The laboratory analyses resulted single detect of a single chemical c out of 9 samples analyzed, ethanol.

- This detect was in only one of the two monitoring . wells sampled

- Actual sample levels for organics are so low they are measurable. i The compound detected is acceptable for public water system.

- EPA linked ethanol to hydraulic fracturing based solely on their revie Material Safety Data Sheets of chemicals that could be used in h.

- The last well stimulation performed on any natural gas well in EPA monitoring wells was performed in 2005.

- Draft report was issued before all data is disclosed and analysis was sci completed ┐a 곱GS disservice to the public, specifically the individuals the living Pavillion natural gas field area who are looking to state and federal agencies for answers to their groundwater concerns regarding drinking water taste and odor.

- The EPA draft report ignores historical USGS data that shows the shallow dom and stock water wells in the Pavillion area naturally have occurring high sodium, hi sulfate, high iron and high carbonate ionic content, and produce some naturally occurring biogenic methane gas. EPA ignored the iron content of the water supply w disregarding its sampling or analysis and therefore discounting iron as a contributor to odor or taste.

- Landowners and groundwater users have known of these groundwater issues before any natural gas wells were drilled in the area. Some landowners moved into the Pavillion natural gas field years after the natural gas wells were drilled.

- EPA provides no evidence that the two monitoring wells represent water wells used by anyone in the Pavillion natural gas field.

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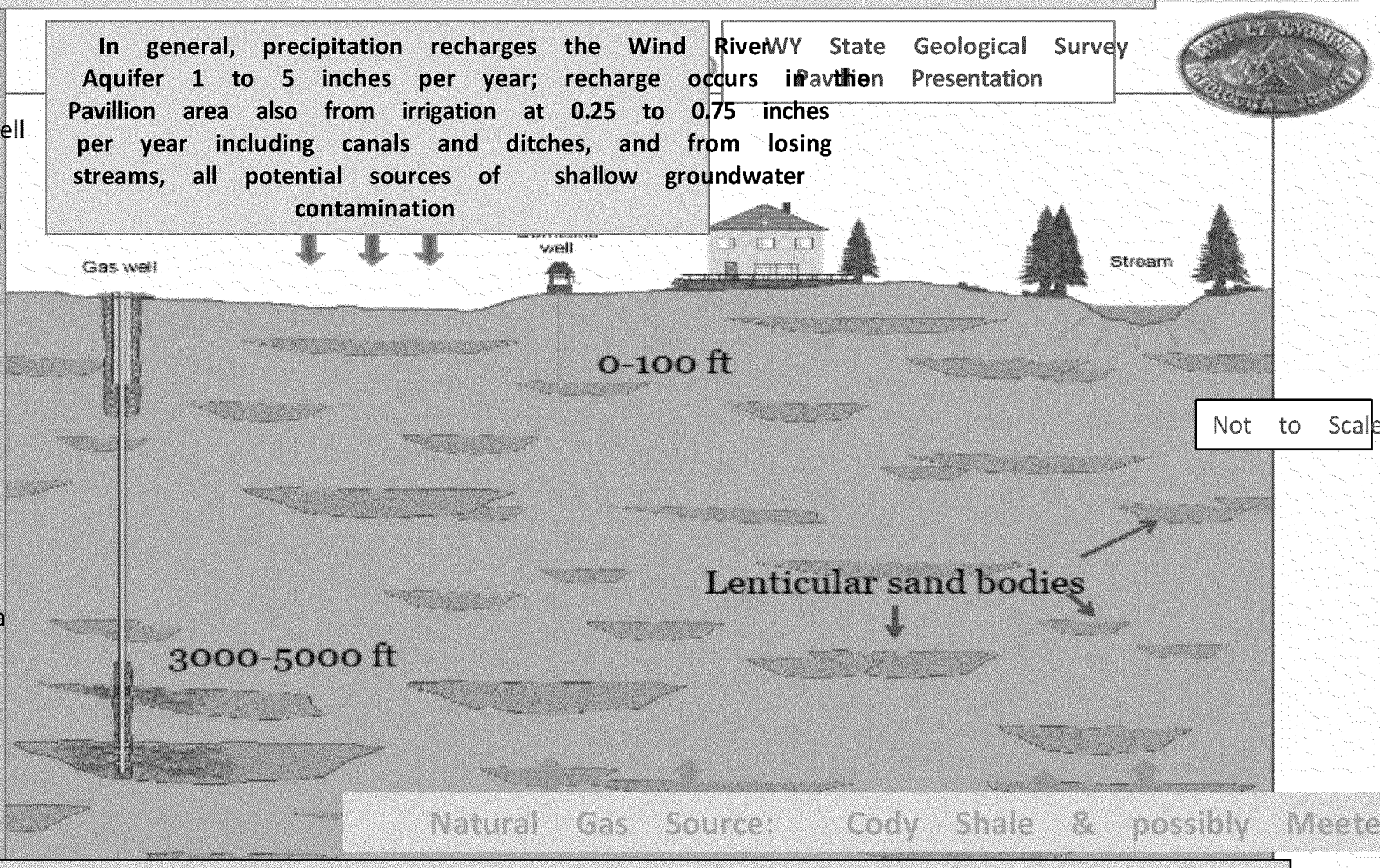
Concern: oil field sites contributed to shallow groundwater contamination; 11 sites identified as landowner concern; 1 site to DEQ reported in 2012

Concern: path for methane from gas well to water supply well; 38 of 169 Pavillion area wells identified as not having primary cement from circulated to surface or into surface casing; bradenhead pressure data collection identified 6 wells for possible remediation; work continues

In general, precipitation recharges the Wind River Aquifer 1 to 5 inches per year; recharge occurs in the Pavillion area also from irrigation at 0.25 to 0.75 inches per year including canals and ditches, and from losing streams, all potential sources of shallow groundwater contamination

WY State Geological Survey Pavillion Presentation



Not to Scale

Natural Gas Source: Cody Shale & possibly Meeteet

Not all lenticular sands are charged with natural gas, some are connected, some are not.

- The report ignores the public outreach effort established with 4 Working Gr meetings held during 2011. Working Groups study Well Integrity and Natural Gas Wel Landowner Identified Sites and are comprised of representatives from federal and state agencies, area landowners, and the natural gas well operat or

  - Work of Well Integrity Team continues after bradenhead testing 34 well identified 6 that require additional research and possible remed iation.

  - Identified Sites Team will finalize findings after 33 sites were investi tested, and with one site added to the ongoing DEQ managed \ Remediation Program and to work toward issuing their report.

- Other possible sources of groundwater contamination remain in the identified area located within the Pavillion natural gas field:
  - from the drilling, completion, and maintenance of the domestic and stock water supply wells;
  - from the active and inactive septic systems, stock pens and feed lots;
  - from the current and historic public and private landfills;
  - from the use of pesticides, fertilizers, and herbicides and subsequent aquifer recharge from irrigation or
  - from fuel stations and vehicle repair shops near landowner water supply wells

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The EPA draft report contains questionable, unverified data or qual

State agency experts cannot support the EPA's analysi conclusions as to the identification of any source of g contamination based on the water supply well and moni sampling and testing data or the draft report.

- State agency scientists contend that the organic chemicals detected were introduced by EPA during the drilling, completion, testing, sampling a laboratory analyses.

Long term science based efforts are being planned by the State of Wyoming, Tribes, the USGS, and EPA for the Pavillion area. This science will utilize proven and repeatable science, along with a critical full disclosure, and will lead to thoughtful conclusions about groundwater in the Pavillion area.

• During week of April 16, 2012 Monitor Well 2 was produced (970 feet) by EPA recovering tubular volume and then was sampled. USGS Monitor Well 2 as their sampling volume protocol cannot be met due to this well. EPA also sampled a select few private water supply wells.

• During week of April 23, 2012 Monitoring Well 3 was produced (790 feet) by EPA. Tests of produced well water started at pH 12 and dropped to 10.6 and then stabilized at pH decline. Wind River formation water pH ranges from natural 9 to 10 across field. Both EPA and USGS sampled the production water. EPA left Pavillion

• USGS pulled production equipment from Monitor Well 2 during week of April 30, 2012. USGS ran a downhole camera, then ran a pressured transducer bailer in an attempt to recover formation fluid. Well 2 was previously to be insufficient to meet USGS sample recovery volume protocol. No samples were taken by USGS.

Laboratory results are anticipated at time of Peer Review Panel, 2012.

EPA at Monitor Well 3, April 16, 2012

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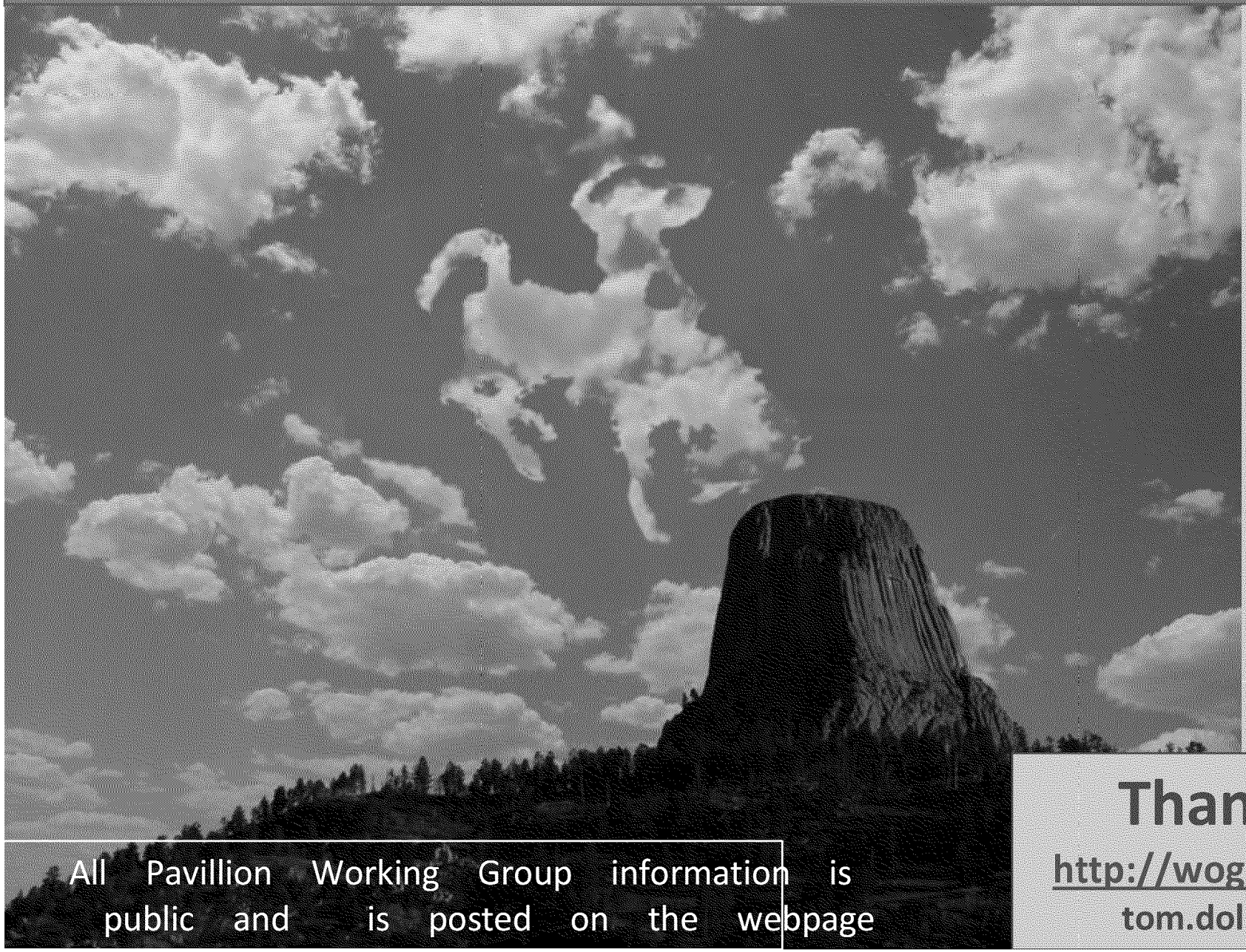

The Wyoming Oil & Gas Conservation Commission webpage provides transparency for all records, reports: click "Completions", enter dates and operator, and select pdf icon under the Completions column

All Pavillion Working Group information is public and is posted on the webpage

Thank you.

http://wogcc.state.wy.us

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